# Center for Risk Excellence Interns 2000

Summary Report of Interns and their Research

August 2000

# **Center for Risk Excellence**



#### INTRODUCTION

For the past three years, the Center for Risk Excellence (CRE) and its National Laboratory and University partners have championed an internship program aimed at providing young people an opportunity to work closely with the U.S. Department of Energy (DOE) in the environmental arena. The 30 participating students have represented a diverse background (Hispanic American, Pacific-Asian American, Native American, African American and European American) and have included undergraduate, bachelor, master, and doctoral candidates. Their involvement in DOE projects offers them hands-on experience and often provides us a fresh perspective.

I believe that the long-term impact of this program to DOE will be significant. The interns extend DOE's arm by attending professional meetings, through their publications, and in their academic work. Some of the participants are preparing to present or publish their summer's work at national meetings or in journals. Many students have gone on to continue their formal education at institutions such as Stanford, Northwestern, Marquette, and the University of Chicago. Others are now teaching in environmental programs. One intern focused his graduate research on a topic important to DOE Environmental Management (risk assessment of chemical mixtures).

We have been very fortunate to work with such fine young adults - our stewards of the future. I invite you to meet the outstanding group of summer interns for the year 2000.

Alvin L.Young, Ph.D.
Director, Center for Risk Excellence

# CRE Summer Interns 2000

#### Pete Tano, Pacific Northwest National Laboratory

# **Quality of Life**

Current risk assessment frameworks address quality of life issues under the catchall "Quality of Life" assessment. This raises the question of whether current Quality of Life assessments adequately address cultural issues. In the context of risk assessment, Quality of Life is used to represent a broad range of community concerns, while culture has become very narrowly defined and is used virtually exclusively in reference to Native American concerns.

The intent of Pete's work is to show that the community concerns addressed in a Quality of Life assessment are, in fact, cultural concerns specific to the culture of that community and not solely dependent upon ethnicity. Quality of Life should be used to reference the scope of the entire risk assessment, which would include human health, ecological. economic cultural assessment



components, instead of applied strictly to an assessment of community-raised concerns. The implementation of the cultural assessment component would address those community concerns. In order to accomplish this, it is vital that standard definitions to both Quality of Life and culture are implemented. This paper examines previous definitions of Quality of Life and culture and looks at differences and similarities between the two.

Pete Tano, a senior at Brigham Young University - Hawaii, is interning at Pacific Northwest National Laboratory in Richland, Washington this summer. Pete is pursuing a Bachelor's degree in Pacific Island Studies. Last summer, Pete interned with the Waitangi Tribunal in Wellington, New Zealand. Pete is working on Quality of Life issues within current Risk Assessment frameworks. At issue is the question of whether current Quality of Life Assessments adequately address cultural issues. In conjunction with this project, Pete is coordinating a meeting between the American Society for Testing and

Materials, the Center for Risk Excellence, and the International Institute for Indigenous Resource Management that will take place in September.

# Larry Lapachin, International Institute for Indigenous Resource Management

# Taxonomy of Community Risk

Risk assessment has focused traditionally on the probability of adverse human and ecological health risk caused by ecological stressors. Although this method allows risk assessors to quantify and justify environmental risks during the decision-making process, the community's overall Quality of Life may not be considered. Because communities are complex and have unique societal, cultural, environmental, health, and other quality of life concerns, a more holistic and environmentally sound method to assess a development and/or cleanup must be established.



Larry's work explores the creation of taxonomy of community risk variables to address Quality of Life concerns. taxonomy will outline the risk. characteristics. consequence(s)/rationale, and data measure pertaining to the risk factor. The taxonomy is also a major component of the "No Net Risk Gain Model". This model ensures the environmental justness of a proposed development and/or cleanup, which can be achieved only if it eliminates or decreases existing risk or introduces or increases benefits for a community. The taxonomy is designed to assist and equip tribes, communities, urban and rural residents, developers, and other stakeholders with a community risk assessment tool

that identifies and inventories the risk burdens in their neighborhoods.

Larry Lapachin, a graduate student from Miami University of Ohio, is interning with the International Institute for Indigenous Resource Management in Denver, Colorado this summer. The Environmental Careers Federal Facility Restoration and Reuse of the U.S. Environmental Protection Agency and the Department of Energy's Center for Risk Excellence support his 4-month internship. Larry is pursuing a master's degree in Environmental Science with a concentration in Urban and Regional Analysis. Before joining the Institute, Larry interned at the City of Hamilton, Ohio, Department of Economic Development, where he co-authored a Brownfield Job Training Grant application that was funded by EPA in May this year. Mr. Lapachin received his B.S. degree in Social Work from the University of Wisconsin-Superior in May 1996. He was then an AmeriCorps volunteer in St. Paul, MN, serving as a tutor and an employment counselor for recent immigrants and refugees. Larry is working with Institute staff and associates on a "No Net Risk Gain Model" for assessing the environmental justice of proposed Brownfield redevelopment and federal facility cleanup

#### Noa Dettweiler, International Institute for Indigenous Resource Management

#### Taxonomy of Community Risk

By applying the "No Net Risk Gain" model to a specific target group, one may gain a greater understanding of the possible benefits and potential conflicts that may arise within risk management. As a representation of this possibility, the issue of Native Hawaiian health has been examined. Native Hawaiians are unique within the United Sates in that they comprise an individual indigenous group with a land base, but are not federally recognized in the manner that other indigenous groups are (Native Americans, for example).

Previous state and federal studies have found that health risk indicators amongst Native Hawaiians are traditionally higher in proportion to overall state levels. Currently, any risk assessment within the Native Hawaiian community is nearly non-existent. Cultural, ecological and social stressors also continue to detrimentally affect this group. At present, there



remains no standardized methodology by which to alleviate these pressures. By applying the "No Net Risk Gain Model" to the Native Hawaiian plight, the potential for overall Quality of Life enhancement remains encouraging.

#### Robert Redsteer, Pacific Northwest National Laboratory

#### Cultural Threat Assessment: Hanford

Robert is currently working on the cultural risk portion of the development of the System Assessment Capability (SAC) software, which is being designed to model the release of hazardous chemicals and radionuclides via groundwater into the Columbia River. Hanford engineers will use SAC to develop remediation plans for the Hanford Reservation. As each remediation plan is implemented, there will be possible impacts to the use of the surrounding area along with destruction of important cultural and historical sights. This threat of losing part of a culture, that relies upon the Hanford site for food and spiritual practices is called cultural risk. In order to perform an impact assessment, all choices and decisions, including the methodology to be considered, must be thoroughly reviewed. First, literature written on similar scenarios e.g. the Exxon Valdez oil spill is examined for impacts upon various cultures and the applied methodologies are examined and criticized. The data is organized and coded to enable quick access to

documents and letters both sent and received by the DOE to prepare for any referencing to past impacts or concerns that may need to be reviewed during data collection or methodology development. Organization of the data is prelude to fieldwork that will enable field researchers to efficiently and effectively collect, analyze, and compare data. The ultimate goal of the data collection will be to quantify the probability of impact and quantify the cultural risk to a specific culture. With this as an endpoint, the research can be applied to SAC software to give engineers insight into remediation proposals. Assessment is a valuable start to important remediation of the valued Hanford Reach. SAC is an attempt to take into consideration the impact of that assessment upon the surrounding cultures, which otherwise might lose part of a way of life due to shortsighted planning. These remediation efforts are, after all, for the health and benefit of the public.

# Stephanie Brown, Medical University of South Carolina

#### **Environmental Science Outreach**

The Environmental Biosciences Program (EBP) is a DOE cooperative agreement program, funded by the Savannah River Operations Office through the Center for Risk Excellence. Program initiatives include Toxicology, Environmental Epidemiology and Risk Assessment and Public Policy. The Public Policy initiative includes projects designed to bridge the gap between the science and policy communities, resulting in effective policy based on the best available science. Two such projects are the Lead

Education Program and the Teachers' Environmental Education Institute (TEEI). The Lead Education Program is an outreach activity of the Community-Based Environmental Protection (CBEP) program in Charleston and North Charleston, SC. The target population is 1,000 women who are either pregnant or the mothers of young children. Objectives are to increase the awareness of the dangers of lead, teach preventive measures, and stress the importance of testing children for lead. Area residents were trained as lay health advisors, who contacted the target population, offering handouts on lead prevention. Follow-up surveys evaluated the handouts' appropriateness and value. U.S. EPA Region 4, South Carolina's Department of Health and Environmental Control and the EBP funded and sponsored the effort.



The TEEI is a graduate-level course that provides teachers with the means, method and motivation for incorporating environmental topics into classroom curriculum. Forty-two middle and high school teachers from South Carolina and Georgia and two teachers from tribal community colleges attended the 2000 TEEI. DOE funds and South Carolina State University and the EBP sponsor the TEEI.

Stephanie Lynn Brown, our intern from the Medical University of South Carolina, is from the Quad Cities. She went to Monmouth College in Monmouth, Illinois where she received her BA in Environmental Science and Biology. Presently, she attends the University of Charleston where she is pursuing her Master in Science in Environmental Studies. Her concentration in the program is in human based toxicology. She is focusing her internship on Environmental Science Outreach. Stephanie has been working with a Community Based Environmental Protection Program (CBEP) focused on lead education. Her project includes a qualitative program evaluation that will be used to report to the USEPA, Region 4. Another project she has been involved with is the Teachers Environmental Education Institute. This institute provides teachers from South Carolina and Georgia information on environmental issues that they can incorporate in their classrooms. Both programs focus on providing information to community members in order to increase awareness of the environment.

# **Molly Martin, Argonne National Laboratory**

#### Cultural Impact Analysis and Quality of Life Issues

The integrated risk team in the Environmental Assessment Division of Argonne National Laboratory (ANL-EAD) is researching issues pertaining to Quality of Life indicators and socio-cultural impact analysis. The current status of the project is to research and summarize Quality of Life issues and indicators so they can be incorporated into cultural assessment scenarios and also a cultural risk matrix. The team's goal is to develop an approach or interpretive tool that will emphasize the most critical issues and focus on the major implications involved in assessing cultural issues as they are related to the contamination and waste from numerous Department of Energy sites nationwide. Integration of these



concepts will be the key component of the entire project such that the approaches developed may be used to analyze an entire spectrum of cultures and communities. Work is being done with the intent of having it apply to various situations where cultural impact analysis must be conducted. With the combined efforts of an anthropologic insight, cultural appreciation and also environmental awareness, this project has much potential to bring issues of cultural impact into the limelight so they receive the necessary attention.

Molly Martin will return this Fall to the University of Chicago for her final year of study towards a double Bachelor of Arts in Anthropology and Environmental Studies. This is her second summer as an intern with the Center. This summer she will be looking at cultural impact assessments, and her main project is to investigate some of the cultural resource issues relevant to the Hanford Site and the Native American Tribes in that

area. Specifically, she will deal with possible cultural impacts resulting from the presence of contamination and large amounts of waste at cleanup sites, including impacts to traditional practices or transformation of cultural resources. There are also issues that pertain to quality of life and overall satisfaction with the environment. The material she develops this summer will also be useful for her senior thesis that is dealing with environmental problems that traditional (e.g., indigenous) people encounter, which can often prohibit them from fully practicing some of their cultural customs.

# Ryan Ramos, Argonne National Laboratory

# Integrating Economic Risk in Environmental Assessment



Widespread contamination at cleanup sites, such as Hanford, can affect ecological and human health, and extensive remediation may be conducted to address those potential risks. However, budget constraints will limit the extent of remediation, which in turn will influence economic activity at a site and in the region, e.g., at Hanford, the Columbia River and surrounding area. A balance between risk reduction and cost needs to be achieved for the benefit of involved parties and stakeholders. In order to strike this balance, a variety of information can be collected to assess economic risk including the identity of the stakeholders, desired use of resources, cost and benefit of remediation alternatives, and the appropriate

time frame for effective action. Moreover, emphasis can be placed on public risk perception to assist in clarifying perceived and actual risk. This information can then be cataloged and scenarios developed to assist in management decisions regarding contaminated sites. Obtaining this information and integrating it into a cumulative risk framework presents risk assessors with a considerable challenge. This challenge can be met with an innovative approach involving the development of a risk matrix that takes into account human health, ecological, socio-cultural, and economic risk.

Ryan Ramos lives in Darien, Illinois, just north of Argonne National Laboratory. He is currently a senior at Northwestern University seeking to complete his Bachelor of Science Degree in Environmental Science and Economics in the fall. He is in the process of writing a thesis on the future of electrical generation and its impact on global warming which he plans to put up for honors review. During his studies at Northwestern he has worked on several projects dealing with Environmental Impact Statements, including the completion of an original EIS on the feasibility of a new electrical generating facility at the former Zion Nuclear Power Plant site. As an intern he plans to apply and enhance my skills involving risk assessment, especially in the field of economics, in order to contribute to the goals of the CRE team. This includes evaluating economic impacts associated with contaminated sites and specific cleanup options, and helping develop a cumulative risk framework that incorporates economic information.

# Margaret Shanafield, Argonne National Laboratory

# Human Health/ Ecological Risk Assessment Database

One concern at cleanup sites around the country, is, that while there is a wealth of risk assessment data, it has not been organized and is therefore not easily accessible. Therefore, the information must be streamlined and organized into a concise, uniform format in order to assist in decision-making processes. This summer, Margaret has created a database to organize human health risk assessment data for an example site (Hanford). The structure of the database will allow for flexibility in order to address future needs at the site, as well as incorporating ecological risk assessment information. It will provide the ability to search for information by specific contaminants,



locations within the site, environmental media, or documents. Additional expected values or benefits of this database include the possibility to link into information contained in other databases (such as the Cleanup Criteria/Decision Document database and "Depot"), to identify gaps in site-wide analysis, to assess or follow up on cleanup decisions, and to provide a framework for organizing future data. This database can be used not only as a summary of past data collected at a site, but also as a tool for decision-making in the future, since it can highlight changes in contaminant and risk conditions over time.

Margaret Shanafield grew up in Evanston, Illinois, just north of the Windy City. She has just finished her Bachelor's Degree in Environmental Science, with a minor in German, from Northwestern University. Her junior years of both high school and college were spent in Germany attempting to master the language and hike in the Alps as often as possible. During her year in Munich last year, she was able to obtain an internship at the Institute for Hydrochemistry and work on a project to develop a sensor to measure heavy metal ions in water. She is excited to work with the Environmental Assessment Division at Argonne this summer, evaluating human health and ecological risk information to help develop a cumulative risk framework using the Hanford Site as a case study. Among the issues she will be looking at are bioaccumulation and the ecotoxicological effects of contamination, and the interface with the human health assessment.

# **Zach Schreiber, Argonne National Laboratory**

#### Human Health Screening Approach for Multiple Contaminants



The driving factor for the work conducted by the Integrated Risk Team is the presence of chemical contamination at DOE sites. Among the complicated range of issues that surround the task of decision-making at these sites is the presence of potentially, jointly exposed chemicals. When conducting a risk assessment, the assessor examines the amount of risk associated with a specific human activity and a related geographical location. Conventionally, the risk assessment will examine each contaminant independently. Risk estimations are calculated using toxicological information of individual chemicals. However, when jointly present, one chemical may modify the biological behavior of another

chemical, leading to an unexpectedly lower or higher toxicity than seen singly. At many DOE sites, the number of chemicals present is quite large, and the number of combinations of multiple chemicals that might contribute to unexpected effect magnitudes very quickly becomes difficult to manage.

A conceptual framework under development will assist in choosing indicators of potential toxicological interaction. The framework is being used to design a screening method that is currently being tested in a case study by members of the Integrated Risk Team.

Zach Schreiber lives in Chicago, Illinois. He recently graduated with a Master's degree in Environmental Engineering from Northwestern University, where he also received his Bachelor's of Science in Chemical Engineering in 1998. During his graduate program he wrote a thesis titled Chemical Mixtures Risk Assessment: A Conceptual Model and Reconstructive Toxicology. This summer he will further develop this work, including constructing a screening methodology for multiple contaminants at Department of Energy sites to guide the selective analysis of chemicals that may have interactive toxicity with other contaminants. He will conduct this analysis using a toxicity database and options for presenting toxicity information that he created as a DOE intern over the past year.

#### Roxanne Myshkowec, Argonne National Laboratory

#### Human Health Assessment Case Study

Roxanne's work was a detailed extension of one aspect of the human health risk assessment for chemical mixtures being conducted at Argonne's Environmental Assessment Division (EAD). This involved testing the screening approach being developed. Six chemicals that are key contaminants at many DOE sites were chosen

such that the results from the screening method could be compared to existing toxicity data available on the chemicals. In order to simplify the testing stage, certain assumptions were made for the exposure scenario. Once the screening method is tested through this case study, multiple exposure times and routes can be considered. This testing is still a work in progress, but examples of the key components in the process are being developed. In particular, compartmental pictures, toxicokinetic fact sheets, and physiologically based pharmacokinetic (PBPK) models are being developed and compiled for the six chemicals. Compartmental pictures provide a graphic representation of the transport mechanisms within the body. The toxicokinetic fact sheets contain data regarding reactions within the organs in a more readily useable The PBPK models combine the two representations to determine areas of potential temporal overlap by comparing residence times. The flexibility of the models will be useful in the second stage of this project, which will consider changes in the exposure scenario.

Roxanne Myshkowec is from Woodstock, Illinois. After completing her Bachelor of Arts degree in Chemistry from the University of Chicago she went on to graduate school at Northwestern University, where she recently received a Master's degree in Environmental Engineering. For the past two summers she has worked at Argonne National Laboratory as a student intern with a geochemical lab group analyzing bioremediation. Her work included cryogenic isolation of inorganic carbon via a vacuum line, and the determination of stable carbon isotopic ratios using a mass spectrophotometer. She also studied microbial degradation of toluene and trichloroethylene. She has been working in



the Environmental Assessment Division on mixtures risk assessment since April 2000.

#### María V. Reyes-Colón, U.S. Department of Energy, Center for Risk Excellence

#### How Science is Translated into Technology

The objective of this project is to determine how science is being translated into technology development. The Environmental Management Science Program was created to identify and fund research that will result in new approaches for solving DOE's environmental problems. The EMSP is a long-term research program designed to bridge the gap between fundamental research and needs-driven applied technology development. Basically, science goes through a number of steps until it reaches the point of completion. The EMSP designed a strategy for research whereby projects are solicited and selected according to scientific merit and program needs of the DOE sites. Research awardees then conduct the research and interface with Focus Areas representatives at different points in the process.

Finally, research is integrated into technology development activities of the Focus Areas and end-users through a number of interactions. Based on the information gathered the following issues were discovered:

- Reporting requirements are not adequate; researchers are only required to report once a year.
- The interaction/integration with Focus Areas is very limited; therefore, the focus of the research project may not be appropriate to the needs of Focus Areas. As a result, Focus Areas do not fund most of these projects.

The focus of this research was to conduct a qualitative review of the issue; interesting results were obtained. A few recommendations are offered to tackle the situation. The communication process between the EMSP and Focus Areas must be improved. This could be accomplished in part by increasing the numbers of status reports and improving the reporting requirements by defining specific performance measures for the scientists to achieve. The conclusion is that science should be translated through constant communication and feedback.

María V. Reyes-Colón is from Puerto Rico. She is a Chemical Engineering Senior Student with a minor in Environmental Engineering. She goes to school at the University of Puerto Rico Mayagüez Campus. Her hometown is Coamo, a small town in the southern area of the island. In her junior year, she was a Congressional Intern, which was one of the most exciting experiences of her life. María even met the president. In the near future, she will apply to law school in Washington, D.C., her favorite city. María belongs to several student and professional societies, including the Society for Women Engineers, the American Institute of Chemical Engineers and the Society for Women Engineers. For the past 8 years, she has worked part-time as a lifeguard.

Pedro M. Anglada, U.S. Department of Energy, Center for Risk Excellence



Deployment of Phytoremediation at 317/319 Area at Argonne National Laboratory-East

The objective of analyzing the deployment of Phytoremediation at Argonne National Laboratory-East was to learn more about the different ways this technology works and when and where it could be deployed. Phytoremediation was studied because this technology may be used in Puerto Rico to attenuate

several environmental problems in a pleasing, passive way.

To understand how phytoremediation works, the Internet was searched to identify the different mechanisms that take place in situ to clean up the affected site. Specifics of the Argonne project were then studied for more information about the way that the technology was deployed, how the project has been monitored, the contaminants of concern, and the mechanism for contaminant removal. Phytoremediation was deployed at the 317/319 area of Argonne to remediate soil and groundwater contaminated with Volatile Organic Compounds (VOCs) and Tritium. The specific mechanisms anticipated to clean up the Area are: Phytodegradation, Rhyzodegradation, Phytovolatilization and Phytoaccumulation. These four mechanisms will breakdown the contaminants through metabolic processes within the plant, through microbial activity in the root zone, transpiration, and contaminant accumulation in the aboveground portion of the trees. By these four mechanisms, phytoremediation should prove to be a pleasing, passive, solar-energy driven cleanup technique that can be used to remediate several soil and groundwater problems both here and in Puerto Rico.

Pedro M. Anglada is from Puerto Rico. He is a graduate student from the Interamerican University of Puerto Rico in San German. He has BS in Biology with a minor in Environmental Science. Pedro expects to start his graduate studies in Ecology or in Environmental Science at the University of Puerto Rico at Mayagüez. He's from the town of Barceloneta in the northern region of Puerto Rico. During college, he worked as a volunteer in several laboratories' field projects, helping him to develop his technical skills as a biologist. The last project in which Pedro participated was taking samples of zooplankton at Guayanilla Bay to determine the effect of a thermoelectric plant to the plankton.



Another project that he performed was making an aquatic analysis in a determined area of Guanajibo River, considering various water pollutants.

#### Dan Johnston, Ames Laboratory

#### Tradeoffs from DOE Cleanup Actions

The government often has to decide whether to clean up contaminated sites. One reason given for doing such work is that it is necessary to protect public health and safety. If that is the reason for undertaking such actions, it is essential that they save lives rather than cost lives. This paper offers an analysis of the risk assessed for various options associated with Uranium Mill Tailings Remediation Action (UMTRA) clean up actions. For example, the clean up of the Split Rock, CO site was predicted to prevent 0.003 cancer deaths. The cost for this clean up was \$55 million, which comes to \$18 billion per hypothetical life saved. However, this clean up action required over 700,000 miles of truck driving to move and stabilize the tailings pile and, statistically, this amount

of truck traffic should result in more than 0.003 deaths! Thus, not only did the clean up cost \$55 million; it also cost lives. It is hoped that consideration of such issues will lead to a more complete assessment of the risks involved before such projects are undertaken in the future. The risk assessments of the Uranium Mill Tailings Remediation Action clean ups were evaluated and the accuracy was improved in two ways. First, radiation readings on the pile were more accurately modeled. Second, an improved model was developed to model the dose delivered to different segments of the exposed population. Potential errors in the model were also discussed. This research provided a first taste of the risk assessment process. Risk assessment methods were learned and an appreciation for the complications and the large uncertainty involved in the process was developed.

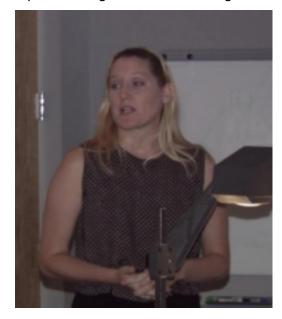
Dan Johnston just graduated with a double major in mathematics and physics from Washington University in St Louis. He has returned to his hometown, Ames, Iowa for employment this summer doing statistical analysis of risk. In the fall, he plans to look for a math-related job. After working for a year or two, he hopes to enter graduate school in mathematics.

# Laura Sweeney, Ames Laboratory

# Workers: The Forgotten Stakeholders

Site remediation involves a tradeoff between risks and benefits to various stakeholders. As such, it is important to ensure that all effected parties are included in the decision making process, and that the process be guided in an ethical manner. The release of contaminated sites may allow for workers to be exposed to significant risks during site

remediation. This study-in-progress investigates the hypothesis that workers are compensated according to the risk they voluntarily and knowingly accept. Exploratory in nature, the study has been constructed using data collected on site at Rocky Flats Environmental Technology Site, and in the communities surrounding the site. Participant observation has been favored as the primary data collection method. A number of case studies provide proxy insight to help narrate the perception and background of the current worker situation. Activists, media, community members, scholars, workers, and staff have been interviewed. Future work will concentrate on the collection and analysis of more extensive worker data. The goal is to find trends and indications that might help



researchers support or refute the hypothesis.

Laura Sweeney is an Iowa State University (ISU) student working on a graduate degree in public administration. She has an interest in international affairs and has worked as a student program assistant at the ISU International Institute of Theoretical and Applied Physics funded by UNESCO. She also does cross-cultural life span research for the ISU Department of Human Development. Her interest in diversity and cultural issues has taken her to such places as Mexico, Guatemala, and Nicaragua. In the future, she plans to continue her travel adventures, the most immediate being a trip to Rocky Flats, Colorado for her CRE internship.

# **Zack Thunemann, Sandia National Laboratory**

#### The Database of Environmental Parameters, Organizations and Tools



The Database of Environmental Parameters, Organizations and Tools (DEPOT) is a joint project between the Environmental Systems Division of Sandia National Laboratories and Oregon State University. DEPOT will serve as a database for qualified environmental pathway data. It will function as a library where a wide range of information about environmental contaminants and pathways will be made available at a single site. Notably, it will include uncertainty and probability distribution information. The expected customer is someone from the DOE complex or perhaps an environmental group. Using DEPOT, a customer will be able to do some initial scoping calculations of environmental

contaminants with minimal data gathering. DEPOT will also include information such as Laws and Regulations, Waste Acceptance Criteria and data for engineered structures. One of the primary goals for DEPOT is to reduce the time spent trying to find general information by including it at one centralized site.

Zack Thunemann recently received a master's degree in applied mathematics from Washington State University. This summer, Zack is working on the DEPOT project. DEPOT will serve as a central data warehouse for qualified environmental pathway data. It will contain a wide range of information about environmental contaminants and pathways. It will include uncertainty information about the various parameters whenever possible. Using DEPOT, a customer will be able to do some initial modeling of environmental contaminants with minimal data gathering.

# **Arista Slate, Argonne National Laboratory**

Arista Slate was born and raised on the South Side of Chicago. During the Fall of 2000 she will be a senior at South Shore Community Academy, also on the South Side of Chicago. Her G.P.A. is a stable 4.0, and she ranks 3<sup>rd</sup> in her class with honors. In May 2000, she was inducted into the National Honors Society. June 2000 saw her awarded MVP of the school track team, when she also received an award from the school volleyball team. She plans to go to college, but hasn't yet decided on any particular school. She is an intern at Argonne National Laboratory looking for experience. She feels she needs to experience different career fields before she plans a specific career. As an intern at Argonne



National Laboratory she has learned how to set up and design a web page. With this new knowledge she is producing a web page explaining what interns do and how Argonne has helped interns in their future studies. She will also be helping with the web site for the Center for Risk Excellence.

# **CRE INTERNS 2000**

Name	Mentor	Organization
Robert Redsteer	Dr. Robert Stenner	Pacific Northwest National
		Laboratory
Pete Tano	Dr. Robert Stenner	Pacific Northwest National
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P. Zachary Thunemann	Dr. Regina Hunter	Sandia National Laboratory
Ryan Ramos	Dr. Margaret MacDonell	Argonne National Laboratory
Margaret Shanafield	Dr. Margaret MacDonell	Argonne National Laboratory
Molly Martin	Dr. Margaret MacDonell	Argonne National Laboratory
Roxanne Myshkowec	Dr. Margaret MacDonell	Argonne National Laboratory
Zach Schreiber	Dr. Margaret MacDonell	Argonne National Laboratory
Arista Slate	Dr. Loren Habegger	Argonne National Laboratory
Stephanie Lynne Brown	Dr. Lawrence Mohr	Medical University of South
		Carolina
Maria Reyes-Colon	Dr. Alvin Young	DOE Center for Risk Excellence
Pedro Anglada	Dr. Alvin Young	DOE Center for Risk Excellence
Dan Johnston	Dr. Martin Edelson	Ames Laboratory
Laura Sweeney	Dr. Martin Edelson	Ames Laboratory

31 July, 00 Dr. Alvin Young, Director, Center for Risk Excellence U.S. Department of Energy

Dear Al,

Thank you, for inviting me to the Summer 2000 Intern Program Review last week. I also wish to thank you and the Center's sponsors for making an Intern available to work with me compiling databases from which we can reassess the UMTRA Program from a risk point of view and evaluate lessons learned. The field trip that Dan Johnston joined me on in early July was a eye opener in terms of the amount of pertinent information that is available to be evaluated and learned from the UMTRA experience. If we can mine the information and get it presented correctly it should be very valuable to EM in terms of lessons learned, a.k.a. how not to do it next time.

I thought the Intern Program Review was especially interesting. I was encouraged to see the caliber and capability of the young people available, albeit most are already college graduates. I was also amazed and encouraged at how fast these young scientists were able to assimilate their tasks and subject/topic background and go to work. Much if not all of their work will be useful to the Center and DOE. The only downside to the summer program is that they can't stay to continue working on many of the projects they have initiated and/or in which they have participated. I thought the individual presentations were well done. It was obvious that all had spent considerable time preparing for the Program Review. The view graphs and handouts were a plus in helping me understand what they were trying to convey. It is obvious that their skills with graphics are coming from their institutional training. I was particularly struck with the information presented by Laura Sweeney in her talk, "Workers: The Forgotten Stakeholders". I also thought the presenters discussing the difficult subject, Quality of Life, and Taxonomy of Community Risk had not only useful information, but showed allot of maturity in thinking through this very difficult subject. Each of the Interns actually had useful information in their presentation; it wasn't hard to tell that they were just not killing a summer, but were really trying to make a contribution. In some cases the subjects are very complex and difficult. It is unfortunate that DOE & contractors can't find the means to keep them working. They would bring a breath of fresh air to the workplace.

Again, thanks for the invitation. If DOE/EM et al., can continue to find the funding for these types of programs it will go a long way to assist DOE in attracting capable young college graduates to apply for DOE jobs.

Sincerely yours,

Bruce W. Church



Left to right: Ryan Ramos; Noa Dettweiler; P. Zachary Thunemann; Larry Lapachin; Margaret Shanafield; Molly Martin; Pete Tano; Stephanie Lynne Brown; Robert Redsteer; Maria Reyes-Colon; Dan Johnston; Laura Sweeney; Pedro Anglada; Roxanne Myshkowec; Zach Schreiber; Arista Slate (not pictured).

The Center would like to thank all of the people who made the summer 2000 CRE internship program possible. We would especially like to thank our Headquarters sponsors, Mr. Randy Scott and Dr. Robert Goldsmith, for helping to fund the program and Dr. Harvey Drucker, our Argonne Cosponsor. We would also like to thank all of the sponsors, hosts, and mentors who participated in the program including; Margaret MacDonell, Loren Habegger, Bruce Church, William Andrews, Robert Stenner, Mervyn Tano, Regina Hunter, Martin Edelson, Lawrence Mohr, Anibal Taboas, and Yvette Collazo.